VERIFICATION OF TRANSLATION

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I am fluent in both the English and Japanese languages and capable of translating documents from one into the other of these languages.

The attached document is a true and accurate English translation to the best of my knowledge and belief of the certified copy of Japanese patent Application No.2005-054700 filed on February 28, 2005.

I state that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true.

Signature: Mie Hata

Mie HATA

Date: October 6, 2011

JAPAN PATENT OFFICE

This is to certify that the annexed is a true copy of the following application as filed with this Office.

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Applicant(s): SEKISUI CHEMICAL CO., LTD.

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【List of Annexed Document】

【Name of matter】 Claims 1

【Name of matter】 Specification 1

【Name of matter】 Abstract 1

[Name of Document] Scope of Claims

[Claim 1]

A color interlayer film for laminated glass, comprising a resin composition containing a polyvinyl acetal resin, a coloring agent, and an infrared ray shielding agent, characterized in that the resin composition further contains a phosphoric acid ester compound at a ratio of 5 parts by weight or less to 100 parts by weight of the polyvinyl acetal resin.

[Claim 2]

The color interlayer film for laminated glass according to claim 1, wherein the phosphoric acid ester compound is a trialkyl phosphate, a trialkoxyalkyl phosphate, a triaryl phosphate, or an alkyl aryl phosphate.

[Claim 3]

The color interlayer film for laminated glass according to claim 1, wherein the phosphoric acid ester compound is trioctyl phosphate, triisopropyl phosphate, tributoxyethyl phosphate, tricresyl phosphate, or isodecylphenyl phosphate.

[Claim 4]

The color interlayer film for laminated glass according to any one of claims 1 to 3, wherein the content of the phosphoric acid ester compound is 0.001 to 5 parts by weight relative to 100 parts by weight of the polyvinyl acetal resin.

[Claim 5]

A laminated glass, characterized in that the color interlayer film for laminated glass according to any one of claims 1 to 4 intervenes between at least one pair of glass plates.

[Name of Document] Specification

[Title of the Invention] COLOR INTERLAYER FILM FOR LAMINATED GLASS, AND LAMINATED GLASS

[Technical Field]

[0001]

The present invention relates to a color interlayer film for laminated glass, and laminated glass using said interlayer film for laminated glass.

[Background Art]

[0002]

Conventionally, laminated glass obtained by inserting an interlayer film of a polyvinyl butyral resin between at least two glass plates has an excellent transparency, weather resistance, adhesion strength and penetration resistance as well as an anti-scattering property as basic properties, and accordingly has been used widely for window glass of automobiles and buildings.

To heighten the beauty of laminated glass, laminated glass using a color interlayer film comprised of a polyvinyl acetal resin and a coloring agent has also been used widely.

[0003]

However, if the color interlayer film is placed in a highly humid atmosphere, discoloration of its original color into white (whitening) may occur. Further, the color interlayer film is desired to have high transparency, but if the color interlayer film has a light ray transmittance exceeding 50%, even slight whitening discoloration tends to be noticeable. Therefore, it

has been desired to develop a color interlayer film for laminated glass capable of preventing whitening of the color interlayer film and maintaining the original color of the color interlayer film, and laminated glass using the interlayer film.

[Disclosure of the Invention]

[Problem to be Solved by the Invention]

[0004]

An object of the present invention is to provide a color interlayer film for laminated glass that while maintaining basic properties of an interlayer film for laminated glass, is excellent in the infrared ray shielding property, and resistant to whitening in the interlayer film part even in the case of moisture absorption, and also to provide laminated glass using the interlayer film. Another object of the present invention is to provide a color interlayer film that is highly transparent but capable of preventing whitening, keeping the original color, and maintaining low infrared ray transmittance, and also to provide laminated glass using the interlayer film.

[Means for Solving the Problem]

[0005]

The inventor of the present invention has made various investigations to accomplish the above-mentioned objects and has found that the above-mentioned problems are all solved by adding a phosphoric acid ester compound at a ratio of 5 parts by weight or less to 100 parts by weight of a polyvinyl acetal resin in a resin composition containing the polyvinyl acetal resin, a coloring agent, and an infrared ray shielding agent, and accordingly has completed the invention based on further

investigations.

[0006]

That is, the invention relates to:

(1) a color interlayer film for laminated glass, comprising a resin composition containing a polyvinyl acetal resin, a coloring agent, and an infrared ray shielding agent, characterized in that the resin composition further contains a phosphoric acid ester compound at a ratio of 5 parts by weight or less to 100 parts by weight of the polyvinyl acetal resin;

(2) the color interlayer film for laminated glass according to the above (1), wherein the phosphoric acid ester compound is a trialkyl phosphate, a trialkoxyalkyl phosphate, a triaryl phosphate, or an alkyl aryl phosphate;

(3) the color interlayer film for laminated glass according to the above (1), wherein the phosphoric acid ester compound is trioctyl phosphate, triisopropyl phosphate, tributoxyethyl phosphate, tricresyl phosphate, or isodecylphenyl phosphate;

(4) the color interlayer film for laminated glass according to any one of the above (1) to (3), wherein the content of the phosphoric acid ester compound is 0.001 to 5 parts by weight relative to 100 parts by weight of the polyvinyl acetal resin; and

(5) a laminated glass, characterized in that the color interlayer film for laminated glass according to any one of the above (1) to (4) intervenes between at least one pair of glass plates.

[Effect of the Invention]

[0007]

The color interlayer film for laminated glass of the present

invention, and laminated glass using the film are excellent in the infrared ray shielding property and resistant against whitening while keeping basic properties of an interlayer film for laminated glasses or of a laminated glass. Also, the color interlayer film for laminated glass of the present invention and the laminated glass using the film are excellent in the infrared ray shielding property and capable of preventing whitening and keeping the original color even if they are highly transparent.

[Best Mode for Carrying Out the Invention]

[0008]

The color interlayer film for laminated glass of the present invention is a color interlayer film for laminated glass, comprising a resin composition containing a polyvinyl acetal resin, a coloring agent, and an infrared ray shielding agent, and characterized in that the resin composition further contains a phosphoric acid ester compound at a ratio of 5 parts by weight or less to 100 parts by weight of the polyvinyl acetal resin.

[0009]

The phosphoric acid ester compound to be used in the invention may include, for example, a trialkyl phosphate, a trialkoxyalkyl phosphate, a triaryl phosphate, and an alkyl aryl phosphate, and here, "alkyl" means an alkyl group having 1 to 12 carbon atoms and "aryl" means an aromatic hydrocarbon group optionally substituted with a substituent (e.g. a phenyl group optionally substituted with a substituent such as a lower alkyl having 1 to 4 carbon atoms and a lower alkoxy having 1 to 4 carbon atoms). More specific examples of the above-mentioned phosphoric acid

ester compound include trioctyl phosphate, triisopropyl phosphate, tributoxyethyl phosphate, tricresyl phosphate, and isodecylphenyl phosphate.

[0010]

The content of the phosphoric acid ester compound is 5 parts by weight or less, usually 0.001 to 5 parts by weight, relative to 100 parts by weight of the polyvinyl acetal resin.

[0011]

The polyvinyl acetal resin to be used in the present invention is preferably those having an average acetalization degree of 40 to 75% by mole. If it is lower than 40% by mole, the compatibility with a plasticizer is decreased and it is sometimes difficult to mix a plasticizer in an amount needed for surely attaining penetration resistance. If it exceeds 75% by mole, the mechanical strength of the resultant color interlayer film for laminated glass may be lowered, and it takes a long reaction time to obtain the resin, which is undesirable in terms of the process. It is more preferably 60 to 75% by mole and even more preferably 64 to 71% by mole.

[0012]

With respect to the above-mentioned plasticized polyvinyl acetal resin, those which comprise 30% by mole or less of a vinyl acetate component are preferable. If it exceeds 30% by mole, blocking easily occurs at the time of producing the resin and makes the production difficult. It is preferably 19% by mole or less.

[0013]

The above-mentioned plasticized polyvinyl acetal resin comprises a vinyl acetal component, a vinyl alcohol component,

and a vinyl acetate component, and each amount of these components can be measured, for example, by "Polyvinyl Butyral Test Method", JIS K6782 and nuclear magnetic resonance method (NMR).

[0014]

In the case where the above-mentioned polyvinyl acetal resin is other than polyvinyl butyral resin, the amount of the vinyl acetal component can be calculated by measuring each amount of the vinyl alcohol component and the vinyl acetate component and subtracting the amounts of both components from 100.

[0015]

The above-mentioned polyvinyl acetal resin can be produced by a conventionally known method. For example, a method may be carried out as follows: a polyvinyl alcohol is dissolved in warm water and the resulting aqueous solution is kept at the predetermined temperature, for instance, at 0 to 95°C, preferably 10 to 20°C and mixed with a necessary acid catalyst and aldehyde to promote acetalization reaction under stirring condition. Next, the reaction temperature is raised to 70°C for aging to complete the reaction and after that, neutralization, water washing, and drying steps are carried out to obtain a powder of a polyvinyl acetal resin.

[0016]

As a polyvinyl alcohol which is served as the raw material, those having an average polymerization degree of 500 to 5000 are preferable and those having an average polymerization degree of 1000 to 2500 are more preferable. If the average polymerization degree is lower than 500, the penetration resistance of the resultant laminated glass may be decreased in some cases. If the average polymerization degree exceeds

5000, the formation of the resin film is sometimes difficult and the strength of the resin film may be excessively increased.
[0017]

Since it is preferable to set the amount of the vinyl acetate component of the resultant polyvinyl acetal resin to 30% by mole or less, the saponification degree of the above-mentioned polyvinyl alcohol is preferably 70% by mole or higher. If it is lower than 70% by mole, the transparency and heat resistance of the resin may be decreased and also the reactivity may be decreased in some cases. It is more preferably 95% by mole or higher. The average polymerization degree and saponification degree of the above-mentioned polyvinyl alcohol can be measured, for example, according to "Polyvinyl Alcohol Test Method", JIS K6726. The above-mentioned aldehyde is preferably an aldehyde having 3 to 10 carbon atoms. If the number of carbon atoms of the aldehyde is less than 3, sufficient resin film formability cannot be obtained in some cases. If the number of carbon atoms of the aldehyde exceeds 10, the reactivity of acetalization is decreased, blocking of the resin easily occurs during the reaction, and thus the resin synthesis tends to be difficult.
[0018]

The above-mentioned aldehyde is not particularly limited and may include, for example, aliphatic, aromatic, and alicyclic aldehydes such as propionaldehyde, n-butyl aldehyde, isobutyl aldehyde, valeraldehyde, n-hexylaldehyde, 2-ethylbutyl aldehyde, n-heptyl aldehyde, n-octyl aldehyde, n-nonyl aldehyde, n-decyl aldehyde, benzaldehyde, and cinnamaldehyde. Preferable aldehydes include, for example, aldehydes having 4 to 8 carbon atoms, such as n-butyl aldehyde, n-hexyl aldehyde,

2-ethylbutyl aldehyde, and n-octyl aldehyde. When n-butyl aldehyde having 4 carbon atoms is used, the resin can be easily produced and the resultant polyvinyl acetal resin provides resin films with strong adhesion and excellent weather resistance. Therefore, n-butyl aldehyde is more preferable. The aldehydes may be used alone, and two or more of them may be used in combination.

[0019]

As the infrared ray shielding agent to be used in the present invention, for example, metal fine particles or organic infrared ray absorbents can be used.

[0020]

Examples of the above-mentioned metal fine particles include various kinds of metals such as Sn, Ti, Si, Zn, Zr, Fe, Al, Cr, Co, Ce, In, Ni, Ag, Cu, Pt, Mn, Ta, W, V as well as Mo; various kinds of oxides such as SnO_2, TiO_2, SiO_2, ZrO_2, ZnO, Fe_2O_3, Al_2O_3, FeO, Cr_2O_3, CeO_2, In_2O_3, NiO, MnO, and CuO; nitrides such as TiN and AlN, or nitride oxides; sulfides such as ZnS; doped materials such as 9 wt% Sb_2O_3-SnO_2 (ATO: manufactured by Sumitomo Osaka Cement, Co., Ltd.) and F-SnO_2; and compounded oxides such as SnO_2-10 wt% Sb_2O_3 and In_2O_3-5 wt% SnO_2 (ITO: manufactured by Mitsubishi Materials Corp.). Among them, ATO and ITO are particularly preferable since they satisfy the requirements for use for automobiles.

[0021]

The content of the above-mentioned infrared ray shielding agent depends on its type, but is usually 0.001 to 10 parts by weight relative to 100 parts by weight of the polyvinyl acetal resin.

[0022]

The coloring agent to be used in the present invention is not particularly limited, and general purpose materials such as color toners, pigments, dyes and the like may be used. For example, as the color toners, green, black, blue, red toners can be used, and they may be used alone or in the form of their mixture.

[0023]

Also, as the pigments, inorganic pigments such as carbon black, and titanium white; nitro- or nitroso-type pigments; azo type pigments; and phthalocyanine type pigments can be used, and as the dyes, azo type dyes, anthraquinone type dyes, and phthalocyanine type dyes can be used.

[0024]

The content of the above-mentioned coloring agent is not particularly limited, and may be approximately an amount usually used for color interlayer films for laminated glass and can be properly determined in accordance with an aimed color.

[0025]

The resin composition of the present invention may contain conventionally known additives such as an ultraviolet absorbent, a plasticizer, an antioxidant, a photostabilizer, and a surfactant, in addition to the above-mentioned components.

[0026]

The above-mentioned ultraviolet absorbent may include, for example, benzotriazole derivatives such as 2-(2′-hydroxy-5′-methylphenyl)benzotriazole, 2-(2′-hydroxy-3′,5′-di-tert-butylphenyl)benzotriazole, 2-(2′-hydroxy-3′-tert-butyl-5′-methylphenyl)-5-chlorobenzot

riazole,
2-(2'-hydroxy-3',5'-di-tert-butylphenyl)-5-chlorobenzotriazole, and
2-(2'-hydroxy-3',5'-di-tert-amylphenyl)benzotriazole;
benzophenone derivatives such as 2,4-dihydroxybenzophenone,
2-hydroxy-4-methoxybenzophenone,
2-hydroxy-4-octoxybenzophenone,
2-hydroxy-4-dodecyloxybenzophenone,
2,2'-dihydroxy-4-methoxybenzophenone,
2,2'-dihydroxy-4,4'-dimethoxybenzophenone, and
2-hydroxy-4-methoxy-5-sulfobenzophenone; and cyanoacrylate derivatives such as 2-ethylhexyl-2-cyano-3,3'-diphenyl acrylate and ethyl-2-cyano-3,3'-diphenyl acrylate.

[0027]

As the above-mentioned plasticizer, there can be used a conventionally known plasticizer used for this kind of interlayer film, including plasticizers such as organic esters (e.g. monobasic acid esters and polybasic acid esters).

[0028]

Preferable examples of the above-mentioned monobasic acid esters include glycol type esters obtained by the reaction of triethylene glycol with an organic acid such as butyric acid, isobutyric acid, caproic acid, 2-ethylbutyric acid, heptanoic acid, n-octanoic acid, 2-ethylhexanoic acid, pelargonic acid (n-nonanoic acid), and decanoic acid. Additionally, esters of tetraethylene glycol or tripropylene glycol with the above-mentioned organic acids may also be used.

[0029]

Preferable examples of the above-mentioned polybasic acid

esters include esters of organic acids such as adipic acid, sebacic acid, and azelaic acid with straight chain or branched alcohols having 4 to 8 carbon atoms.

[0030]

Specific preferable examples of the above-mentioned organic ester type plasticizers include triethylene glycol di-2-ethylbutyrate, triethylene glycol di-2-ethylhexoate, triethylene glycol dicaprylate, triethylene glycol di-n-octoate, triethylene glycol di-n-heptoate, and tetraethylene glycol di-n-heptoate and further include dibutyl sebacate, dioctyl azelate, and dibutylcarbitol adipate.

[0031]

In addition, ethylene glycol di-2-ethylbutyrate, 1,3-propylene glycol di-2-ethylbutyrate, 1,4-propylene glycol di-2-ethylbutyrate, 1,4-butylene glycol di-2-ethylbutyrate, 1,2-butylene glycol di-2-ethylenebutyrate, diethylene glycol di-2-ethylbutyrate, diethylene glycol di-2-ethylhexoate, dipropylene glycol di-2-ethylbutyrate, triethylene glycol di-2-ethylpentoate, tetraethylene glycol di-2-ethylbutyrate, and diethylene glycol dicaprylate can also be used as the plasticizer.

[0032]

The amount of the above-mentioned plasticizer is preferably 20 to 70 parts by weight relative to 100 parts by weight of the polyvinyl acetal resin and more preferably 40 to 60 parts by weight. If it is less than 20 parts by weight, the penetration resistance of the resultant laminated glass may be decreased, and if it exceeds 70 parts by weight, the plasticizer may bleed to increase the optical strain and decrease the transparency

and adhesion property of the resin film in some cases.

[0033]

The above-mentioned antioxidant is not particularly limited, and includes, for example, a phenol type antioxidant such as tert-butylhydroxytoluene (trade name: Sumilizer BHT, manufactured by Sumitomo Chemical Co., Ltd.) and tetrakis-[methylene-3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)propionate]methane (Irganox 1010, manufactured by Ciba-Geigy Corp.).

[0034]

As the above-mentioned photostabilizer, hindered amine type ones such as Adeka Stab LA-57 (trade name), manufactured by Asahi Denka Co., Ltd., can be used.

[0035]

As the above-mentioned surfactant, for instance, sodium lauryl sulfate and alkylbenzenesulfonic acid can be used.

[0036]

(Production method)

There is no particular limitation to the production method of the color interlayer film for laminated glass of the present invention. The color interlayer film can be produced by incorporating predetermined amounts of a coloring agent, an infrared ray shielding agent and a phosphoric acid ester compound, and optionally other additives into a polyvinyl acetal resin, kneading the mixture uniformly, and forming the kneaded product into a sheet-like resin film by an extrusion method, a calender method, a press method, a casting method, an inflation method or the like.

[0037]

In consideration of the minimum and necessary penetration resistance and weather resistance for laminated glass, the thickness of the entire color interlayer film for laminated glass of the present invention is, in its practical use, generally preferably in a range of 0.3 to 1.6 mm similar to the thickness of a common interlayer film for laminated glass.

[0038]

As the glass plate to be used for the laminated glass, not only an inorganic transparent glass plate but also an organic transparent glass plate such as a polycarbonate plate and a poly(methyl methacrylate) plate may be used.

[0039]

The type of the above-mentioned inorganic transparent glass plate is not particularly limited, and various kinds of inorganic glasses such as float plate glass, polished plate glass, figured glass, mesh-inserted plate glass, wire-inserted plate glass, heat beam-absorbing plate glass, and colored plate glass can be used. They may be used alone, and two or more of them may be used in combination. Further, an inorganic transparent glass plate and an organic transparent glass plate may be laminated. The thickness of the glass can be properly selected based on the applications and is not particularly limited.

[0040]

In order to produce the laminated glass of the present invention, a conventional method for production of laminated glasses may be employed. For instance, a color interlayer film made of the resin film formed by the above-mentioned method is inserted between two transparent glass plates; the laminated product is placed in a rubber bag and preliminary adhesion is

carried out at about 70 to 110°C under reduced pressure; and then complete adhesion is carried out at a temperature of about 120 to 150°C under a pressure of about 10 to 15 kg/cm^2 by using an autoclave or a press to produce a laminated glass.

[0041]

In the production method of the laminated glass, the above-mentioned color interlayer film formed of a plasticized polyvinyl acetal resin may be inserted between at least one pair of glass plates, and pressure-bonded to the plates under heating at a temperature of 60 to 100°C while vacuum degassing is simultaneously carried out under reduced pressure. More specifically, a laminated product of a glass plate/color interlayer film/glass plate placed in a rubber bag is placed in, for example, an autoclave, and pressure-bonding is carried out under heating at a temperature of about 60 to 100°C under a pressure of about 1 to 10 kg/cm^2 for about 10 to 30 minutes while vacuum-degassing is carried out at about -500 to -700 mmHg. In this way, degassing and adhesion can be simultaneously performed.

[0042]

In this production method, the adhesion force between the color interlayer film and the glass can be adjusted within a proper desired range by, as described above, limiting the temperature during pressure-bonding under heating within a temperature range of 60 to 100°C, and properly setting various conditions such as pressure-bonding pressure, pressure-bonding duration, and pressure reduction degree during vacuum degassing within the above-mentioned ranges.

[Examples]

[0043]

Hereinafter, the invention will be described in more detail with reference to Examples, however it is not intended that the invention be limited to the illustrated Examples.

[0044]

(Examples 1 to 6 and Comparative Example)

A plasticizer-dispersed solution obtained by dispersing 0.28 parts by weight of tin-doped indium oxide (ITO) and 0.014 parts by weight of trioctyl phosphate in 10 parts by weight of triethylene glycol diethylhexanoate (3GO), and in addition, 29 parts by weight of triethylene glycol diethylhexanoate (3GO), a color toner (the kinds of the colors used are as described in Table), an antioxidant, and an ultraviolet absorbent in each amount described in the following Table 1 were added to 100 parts by weight of polyvinyl butyral resin, followed by mixing with three rolls. The resultant mixtures were formed by heat press into polyvinyl butyral resin sheets (color interlayer films) with a thickness of 0.76 mm.

[0045]

[Table 1]

Example No.	Resin (PVB)	Plasticizer (3GO)	Antioxidant (BHT)	Ultraviolet absorbent	Antistatic agent	Infrared ray shielding agent (ITO)	Phosphoric acid ester	Color toner (remark)
1	100	39	0.4	0.4	0.3	0.28	0.014	0.099 (green + black)
2	100	39	0.84	0.84	0.32	0.28	0.014	0.099 (green + black)
3	100	39	0.4	0.4	0.3	0.28	0.014	0.08 (black + blue + red)
4	100	39	0.84	0.84	0.32	0.28	0.014	0.08 (black + blue + red)
5	100	39	0.4	0.4	0.3	0.28	0.014	0.679 (black + blue + red)
6	100	39	0.84	0.84	0.32	0.28	0.014	0.679 (black + blue + red)
Comparative Example	100	39	0.2	0.2	0.3	0	0	0.703 (black + blue + red)

(remark) green means a green toner, black means a black toner, blue means a blue toner, and red means a red toner.

[0046]

(Test example)

According to the following test methods, the haze values of the polyvinyl butyral resin sheets obtained in the above-mentioned Examples 1 to 6 and Comparative Example as they were or while being sandwiched with clear glass, and the light transmittance etc. of the resin sheets were measured. The test results are shown in the following Tables 2 and 3.

(Test method)

1. Measurement of the haze value:

The measurement was carried out by using an integrating turbidimeter 24 hours after the color interlayer films were immersed in water at 23°C as they were or while being sandwiched with clear glass.

2. Measurement of the light transmittance:

The following measurement and evaluation were carried out for the resultant laminated glasses.

The transmittance of the light with a wavelength ranging from 340 to 2100 nm was measured by a spectrophotometer (Self-recording type 340 Model, manufactured by Hitachi Ltd.) and visible light transmittance, sunlight transmittance Ts 2100, color tone and the like were measured according to JIS R3106.

[0047]

[Table 2]

Example No.	Haze value (AVE)		Heat shielding property			
	Film alone	Sandwiched by clear glass	Ts2100 (%)	T (1550 nm) (%)	T (850 nm) (%)	Y value of light A
1	42.9	31.3	61.5	14.2	69.0	79.0
2	38.0	35.0	60.4	12.0	68.4	78.3
3	39.0	30.8	57.6	12.5	67.2	72.8
4	39.9	27.3	57.0	12.1	66.9	72.4
5	41.6	33.6	26.6	10.0	39.4	20.8
6	45.7	36.2	26.1	9.5	39.1	20.3
7	89.6	88.9	34.7	57.5	42.8	21.6

[0048]

[Table 3]

Example No.	Color of the transmitted light			Color of the reflected light			
	L* (transmittance at 2° of light A)	a* (transmittance at 2° of light A)	b* (transmittance at 2° of light A)	Reflectance Y1 (at 2° light C)	L* (reflectance at 2° of light A)	a* (reflectance at 2° of light A)	b* (reflectance at 2° of light A)
1	91.2	-1.7	2.4	-3.7	33.9	-1.3	-0.8
2	90.9	-1.8	2.9	-2.6	33.5	-1.3	-0.5
3	88.4	-3.4	1.3	-6.5	32.6	-2.5	-1.2
4	88.2	-3.5	1.6	-6.5	32.9	-2.5	-1.2
5	52.7	-0.9	-5.6	0.1	28.3	1.2	-0.3
6	52.2	-0.8	-5.4	0.0	28.2	1.1	-0.3
7	53.6	-2.6	-7.3	-2.8	27.6	0.5	-0.7

As can be understood from the above Tables 2 and 3, even if the color interlayer films of the present invention are color interlayer films having a light transmittance exceeding 50%, they are remarkably excellent in the haze values as compared with that of the comparative film, and capable of preventing whitening. Also, it can be understood that even if the color interlayer films of the present invention are color interlayer films having a light transmittance exceeding 50%, they can keep low infrared ray transmittance since infrared rays are remarkably shielded by the infrared ray shielding agent.

[Industrial Applicability]

[0049]

The laminated glass produced by using the color interlayer film for laminated glass in accordance with the present invention is useful for window glass of automobiles and buildings.

[Name of Document] Abstract

[Abstract]

[Problem]

An object of the present invention is to provide a color interlayer film that is excellent in the infrared ray shielding property and resistant against whitening in the interlayer film part even in the case of moisture absorption while keeping the basic properties of an interlayer film for laminated glass; and to provide laminated glass using said interlayer film.

[Means for solving the problem]

A color interlayer film for laminated glass, comprised of a resin composition containing a polyvinyl acetal resin, a coloring agent, and an infrared ray shielding agent and characterized in that the resin composition further contains a phosphoric acid ester compound at a ratio of 5 parts by weight or less to 100 parts by weight of the polyvinyl acetal resin.

[Chosen Drawing] None

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